WARNING

Because of possible shock or fire hazards, connection of this instrument should be performed in compliance with the National Electric Code (ANSI C1) or any other requirements, or both, which may be applicable to the user. Installation, operation, and maintenance should only be performed by qualified personnel.

Rev. B

TM-113825-1

VOLUME 1-- OPERATOR'S MANUAL

626-PA-6037 MEMORY MODULE

626-PA-6038 MEMORY/MODEM MODULE

12/15/88

See opposite side relative to proprietary rights.

NOTE: Refer to Volume 2 of TM-113825 for Service and Maintenance instructions.

COPYRIGHT © 1988

DRANETZ TECHNOLOGIES, INC.
ALL RIGHTS RESERVED.

DRANETZ TECHNOLOGIES, INC.
1000 New Durham Road
Edison, New Jersey 08818
(201) 287-3680

NOTICE REGARDING DRANETZ' PROPRIETARY RIGHTS

This publication contains information proprietary to Dranetz Technologies, Inc. By accepting and using this manual, the user agrees that the information contained herein will be used solely for the purpose of repairing or operating equipment of Dranetz Technologies, Inc. These manuals are to be returned to Dranetz Technologies, Inc. when no longer required by the user, or when there is a change in ownership of the equipment.

These publications are protected under the Copyright laws of the United States Title 17 et seq. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system or translated into any language or computer language, in any form, by any means, electronic, mechanical, magnetic, optical, chemical, manual, or otherwise, without the expressed written consent of Dranetz Technologies, Incorporated, 1000 New Durham Road, Edison, New Jersey 08818.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

STATEMENT OF WARRANTY

All products of Dranetz Technologies, Inc. are warranted to the original purchaser against defective material and workmanship for a period of one year from the date of delivery. Dranetz will repair or replace, at its option, all defective equipment returned, freight prepaid, during the warranty period, without charge for repair, provided there is no evidence that the equipment has been mishandled or abused. This warranty shall not apply to any defects resulting from improper or inadequate maintenance, buyer-supplied hardware/software interfacing, unauthorized modification or misuse of the equipment, operation outside of the environmental specifications, or improper site preparation or maintenance.

The information in this manual has been reviewed and is believed to be entirely reliable. No responsibility, however, is assumed for any inaccuracies. The material in this manual is for information purposes only, and is subject to change without notice.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

TABLE OF CONTENTS
(Page 1 of 4)

Section			Page
I		GENERAL INFORMATION	
Subsection			
1.1		SCOPE	1-1
1.2		INTRODUCTION	1-1
1.2.1		Overview	1-1
1.3		PURPOSE	1-2
1.4		APPLICATIONS	1-2
1.5		PHYSICAL CONFIGURATION	1-2
1.6		TECHNICAL SPECIFICATIONS	1-3
1.6.1		Data Transmission	1-5
1.6.1.1		Data Transmission from the 626	1-6
1.6.1.2		Data Transmission from the Memory Module	1-6
1.6.2		Programmable Features	1-6
1.7		FUNCTIONAL DESCRIPTION	1-7
1.7.1		Communication with the Series 626 Mainframe	1-7
1.7.2		Communication with a Terminal	1-8
1.7.2.1		Internal Modem (6038)	1-8
1.7.2.2		RS-232C Port	1-9
1.7.3		Communication with a PC	1-9
1.7.4		Operating Modes	1-9
1.7.4.1		Transparent Mode	1-9
1.7.4.2		On Request Mode	1-10
1.7.4.3		Buffered Mode	1-10
1.8		STANDARD ACCESSORIES	1-11
1.9		OPTIONAL ACCESSORIES	1-11
1.10		FACTORY REPAIR	1-11

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

TABLE OF CONTENTS
(Page 2 of 4)

Section		Page
II	**INSTALLATION AND OPERATION**	
Subsection		
2.1	GENERAL	2-1
2.2	INSTALLATION	2-1
2.2.1	Installation Warnings	2-1
2.2.2	Baud Rate	2-1
2.2.3	Load Ratings	2-2
2.2.4	Installation in the Mainframe	2-3
2.2.5	Connection to the Communication Panel	2-3
2.2.6	Connection to the Memory Module RS-232C Port	2-3
2.2.7	Connection to an External 'AT' Compatible Modem	2-3
2.2.8	Connection to the Internal Modem (6038)	2-4
2.2.8.1	Notification of the Telephone Company	2-4
2.2.8.2	Connection to the Telephone Network	2-4
2.2.8.3	Responsibilities of the Telephone Company	2-5
2.2.8.4	In Case of Trouble	2-5
2.2.8.5	Incidence of Harm	2-5
2.2.8.6	Service	2-5
2.3	OPERATION AND PROGRAMMING	2-5
2.3.1	Power-on/reset	2-5
2.3.2	Log-on Procedure	2-6
2.3.2.1	Using the RS-232C Port	2-6
2.3.2.2	Using the Internal Modem of the 6038 Plug-in	2-6
2.3.2.3	Log-on Sequence	2-7
2.4	STATUS MESSAGE	2-7
2.5	MAIN MENU	2-8
2.5.1	FNC1 = CLR MEM	2-8
2.5.2	FNC2 = XMIT MODE	2-9
2.5.3	FNC3 = ID#	2-10
2.5.4	FNC4 = XMIT	2-10
2.5.5	FNC5 = MODEM MENU	2-10
2.5.6	FNC6 = END SESSION	2-12

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

TABLE OF CONTENTS
(Page 3 of 4)

Section			Page
II		**INSTALLATION AND OPERATION (Cont'd)**	
Subsection			
2.6	SAMPLE SESSIONS		2-13
2.6.1		On Request Mode Example	2-13
2.6.2		Buffered Mode Example	2-16

Section			Page
III		**OPERATIONAL TEST**	
Subsection			
3.1	GENERAL		3-1

APPENDIX A		**USING THE 6037/6038 WITH A PC AND DRANETZ SOFTWARE**	
Subsection			
A.1	GENERAL		A-1
A.2	DATA ACQUISITION SOFTWARE (DAS)		A-1
A.2.1		Communication	A-1
A.2.2		Data Retrieval	A-1

APPENDIX B		**ISOLATED SERIAL INTERFACE CABLE INFORMATION**	
Subsection			
B.1	GENERAL		B-1
B.2	PINOUT INFORMATION		B-1

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

TABLE OF CONTENTS
(Page 4 of 4)

Section		Page
APPENDIX C	CONNECTION OF THE MEMORY MODULE TO AN EXTERNAL MODEM	
Subsection		
C.1	GENERAL	C-1
C.2	HARDWARE--RS-232C PIN ASSIGNMENTS	C-1
C.2.1	RS-232C Pin Assignments	C-1
C.2.2	Modem Default Switches	C-2
C.3	SOFTWARE--COMMUNICATION PROTOCOL	C-3

LIST OF ILLUSTRATIONS

Figure		
C-1	Memory Module/External Modem Cable Configuration	C-2

LIST OF TABLES

Table		
1-1	Memory Module Technical Specifications	1-4
1-2	6038 Modem Specifications	1-5
2-1	Table 2-1. Load Rating For Plug-ins	2-2
B-1	Pinout of Optically Isolated/Balanced Serial Interface	B-2

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

NOTES:

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

626-PA-6037 MEMORY MODULE
626-PA-6038 MEMORY/MODEM MODULE

SECTION I
GENERAL INFORMATION

1.1 SCOPE

This manual consists of two volumes. You are reading Volume I, the operator's manual, which is divided into three sections:

I. GENERAL INFORMATION
II. INSTALLATION AND OPERATION
III. OPERATIONAL TEST

Volume 2, the Service manual, contains the maintenance instructions and consists of four sections (refer to Volume 2 for a description of these sections):

IV. THEORY OF OPERATION
V. MAINTENANCE AND CALIBRATION
VI. REPLACEABLE PARTS
VII. SCHEMATICS AND ASSEMBLIES

1.2 INTRODUCTION

This manual provides the installation and operating instructions for the 626-PA-6037 Memory Module (6037 plug-in) and 626-PA-6038 Memory/Modem Module (6038 plug-in). The Memory/Modem Module contains all of the features of the Memory Module in addition to a built-in 300/1200bps modem. All references in this manual to Memory Module apply to both the 6037 and 6038 plug-ins; all references to Memory/Modem Module apply only to the 6038 plug-in.

The Memory Module is designed for operation in the Series 626 Universal Disturbance Analyzer family of Mainframes (all except the Model 626R). Before reading these instructions, you should be familiar the applicable Series 626 Mainframe Operator's Manual.

1.2.1 Overview

The Memory Module can be accessed in the same manner as the Series 626 Mainframe. Communication can occur between the Memory Module and a Data Terminal or Teletype. Communication can also occur with a PC using Dranetz software. (See Appendix A.)

The word "Terminal" is used throughout this manual to indicate a Data Terminal or Teletype.

When instructed in this manual to enter Ctrl+S (or Ctrl and another letter), it means to press the two keys simultaneously.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

1.3 PURPOSE

The Memory Module is a bi-directional interface used during remote operation of the Series 626 Mainframe. The Memory Module provides storage for up to 4096 events from the Series 626 Communication Panel and can be accessed by a Terminal using either an RS-232C cable or a telephone line (with the 6038 plug-in alone or with the 6037 plug-in and an external modem).

Communication can be established between the Memory Module and a Terminal upon request by logging into the Module, or the Memory Module can be programmed to establish contact with a Terminal after a pre-selected amount of data has been stored.

The Memory Module can also provide a connection between the Series 626 Mainframe and a PC equipped with appropriate software (see Appendix B for existing software). Customized software can also be written to communicate with the Memory Module.

1.4 APPLICATIONS

The operating mode selected determines how often event data is transmitted from the Memory Module to the Terminal. In the On Request mode, data is transmitted upon a command from the Main Menu. The Transparent mode transmits events as they occur. The Buffered mode transmits data after a preselected amount of data has been received from the Mainframe.

This preselected amount is measured on a percentage basis and ranges from greater than 0 percent (>0%) full (which will transmit each event as it is received) to greater than 90 percent (>90%) full (which transmits data after 90% of available storage space has been filled). The increments are in 10% intervals: 0%, 10%, 20%, 30%,...,90%. The precise amount of data transmitted will vary with the size of usable First in, First out (FIFO) RAM, as well as the length of time required to establish a valid communication link. After the successful transmission of data, the unit returns to accumulating data until it has again achieved this preselected amount.

Direct communication with the Series 626 Mainframe is performed in the Transparent mode. Any of the standard Series 626 remote commands are passed on to the Mainframe and executed. Responses from the Series 626 Mainframe are then immediately transmitted to the user, again through the Memory Module, giving the appearance of a direct link to the Mainframe.

1.5 PHYSICAL CONFIGURATION

The Memory Module is a single width module 6.5" high by 1.25" wide by 10" deep. It is designed for installation in any standard plug-in slot in the Series 626 Mainframe. Connection to the Series 626 Communication Panel is made with the 626/Comm. Option cable (Dranetz P/N 113677-G1) connected to the 9-pin 'D' connector on the Memory Module's rear panel. Connection to an external device can be made using the 25-pin 'D' connector of the RS-232C port.

With the Memory/Modem Module Option, connection to the telephone system can be made using the RJ-11C jack; a small red LED located on the rear panel indicates when the unit is communicating over the phone line.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

The 6037 plug-in consists of a CPU board. The 6038 plug-in consists of a CPU board and a modem board. The CPU board contains the CPU, Series 626 interface circuitry, RS-232C circuitry, modem control and 128K bytes of memory (CMOS RAM). The 300/1200bps modem board with the 6038 plug-in is FCC registered.

1.6 TECHNICAL SPECIFICATIONS

The CPU board performs on-going diagnostics of all available data storage memory by writing to and reading back a series of test patterns from memory. If an error is encountered, the page on which the error occurred is declared invalid and is not used for storage. The current amount of valid memory is displayed on the system status message. The technical specifications for the Memory Module's (both the 6037 and 6038 plug-ins) Memory, CPU board, and connector ports are in TABLE 1-1. The technical specifications for the internal modem of the 6038 plug-in are in TABLE 1-2.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

TABLE 1-1. MEMORY MODULE TECHNICAL SPECIFICATIONS.

MEMORY	
Size	128 Kilobytes
Type	CMOS Static RAM
Typical Event Capacity	4096 Events
DATA INPUT PORT	
Type	Serial RS-232C format (9-pin 'D' connector)
Baud Rate	Fixed at 9600 baud (626 must also be set to 9600)
Data Transmission	From 626 - on an interrupt basis; To 626 - on a non-interrupt basis
Connection	To 626 Communication port using interface cable (P/N 113677-G1)
RS-232C PORT	
Type	Serial RS-232C (DCE configured)
Baud Rate	Switch selectable, 50 to 9600 baud (unless connection is to an external 'AT' compatible modem)
Data Transmission	Transmitted and received on an interrupt basis
Connection	To a typical RS-232C Device such as a Terminal (using Dranetz cable P/N 103506) or an external 'AT' command set compatible modem (using Dranetz cable P/N 113676-G1).
TELEPHONE PORT (6038 only)	
Type	Standard −9dBm permissive, 2 wire telephone line
Baud Rate	Adjusts to rate of calling modem: 300 or 1200 baud
Data Transmission	Transmitted and received on an interrupt basis
Connection	Standard RJ-11C telephone jack
Status Indicator	Red LED on rear panel lights to indicate when port is active
CPU BOARD	
Processor Type	6303 8-bit CMOS microprocessor
Power Consumption	15 V -170mA typical (with internal modem) - 75mA typical (without internal modem)
System Check	On-going diagnostics of all available data storage memory; Checks the RS-232C, 626, and modem port status lines; Checks for proper modem operation during each modem access.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

TABLE 1-2. 6038 MODEM SPECIFICATIONS.			
Speed	300/1200 bps		
Type	Bell 212A compatible, full duplex with AT command		
FCC registration number	AK396F-72383-MD-E		
Ringer Equivalence	0.5B		
Transmitter			
Frequency	Low speed		
	Originate	Mark	1270 Hz
		Space	1070 Hz
	Answer	Mark	2225 Hz
		Space	2025 Hz
Frequency	High speed		
	Originate		1200 Hz
	Answer		2400 Hz
Output Level	10.5 ±1.5 dBm		
Receiver			
Frequency	Low speed		
	Originate	Mark	2225 Hz
		Space	2025 Hz
	Answer	Mark	1270 Hz
		Space	1070 Hz
Frequency	High speed		
	Originate		2400 Hz
	Answer		1200 Hz
Receiver Sensitivity	−10dBm to −45dBm		
Carrier Loss Delay	70ms		
Hysteresis	2dBm		

1.6.1 Data Transmission

The data path in the Memory Module is basically unidirectional. The primary data flow is from the 626 Communication Panel to the Memory Module's storage memory, and then from the storage memory out through either the RS-232C port or the modem port (for the 6038). Data flow in the reverse direction is limited to single character commands.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

1.6.1.1 Data Transmission from the 626

Upon detection of a valid DSC from the Series 626, the receive interrupt source is enabled and data can flow from the 626 to the Memory Module storage Ram. The only form of error checking in this link is a parity check (even) on the incoming data. Data exhibiting parity errors are ignored.

Data is always transmitted at 9600 baud, 1 start bit, 7 data bits, and even parity, 2 stop bits.

1.6.1.2 Data Transmission from the Memory Module

Data transmission from the Memory Module is formatted as 1 start bit, 7 data bits, even parity, and 2 stop bits. If data is being transmitted through a modem, the baud rate is either 300 or 1200 bps and is program selectable for dial-out or self adjusting on auto-answer. The baud rate of the RS-232C port is switch selectable from 50 to 9600 baud. (This switch setting is for connection to a valid RS-232C device other than a modem.)

Transmit Data Error Checking is selected at the time of log-on by following the initial '@' character with one of the following:

- carriage return - error checking disabled
- Ctrl+T (^T) - error checking enabled
- Ctrl+V (^V) - error checking with text suppression enabled

When communication is through a Terminal, error checking disabled should be selected (by pressing the ENTER key). The other two selections are used by customized software. Below is a brief description of each selection's characteristics.

- Disabled - Transmission is single character with even parity. No provisions are made for re-transmission of corrupted data.

- Enabled - Transmission is in lines of up to 20 characters, terminated by a carriage return/line feed sequence, followed by a checksum byte. Waits up to five seconds for response. Acknowledge (^F) results in a transmission of the next line. Negative acknowledge (^U) results in a re-transmission of the same line. This can occur any number of times. Neither of the above in the five-second interval results in a re-transmission of the line preceded by a clear buffer '^Y' character. This can occur up to three times. After the third attempt, transmission is aborted and the Memory Module terminates the session.

- Enabled with text message suppression - This is the same procedure as above except menus and system messages from the Memory Module are suppressed.

Received Data Error Checking is always enabled and checking is made for even parity. If a parity error is found, the character is ignored. If the parity is correct, the character is echoed.

1.6.2 Programmable Features

The Station ID is a two-digit numeric identification ranging from 00 to 99 that can be programmed by selecting function 3 from the Main Menu. The default value is 00.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

The Data Transmission mode of the Memory Module can be changed by selecting function 2 from the Main Menu. The default mode is On Request.

- Transparent: In this mode, communication between the Series 626 and the user via the Memory Module output port occurs directly.

- On Request: In this mode, data from the Series 626 is stored in the Memory Module memory until a transmit request from the user via either the RS-232C or modem port is received.

- Buffered: In this mode, data from the Series 626 is stored in the Memory Module until a pre-selected amount is received. This amount is measured as a percent of available buffer space ranging from greater than 0% (dump every event) to greater than 90% (dump when buffer is nearly full).

The following Modem Setup Features can be programmed from the Modem Menu (Selection 5 from the Main Menu).

- Telephone Number: Maximum of 16 digits of any of the following characters: 0-9, A-D,#,*,@,/,!,,,W,R. (222 is the default number)

- Originate Speed: Software selectable as either 300 bps or 1200 bps (default value). The modem will answer at the calling modem's rate.

- Dial Type: Either pulse or tone dialing can be software selectable. Tone dialing is the default value.

1.7 FUNCTIONAL DESCRIPTION

The Memory Module is designed to gather output data from the Series 626 Communication Panel, store that data in FIFO RAM, and transmit the data from storage to the end user. Even though this module occupies a standard plug-in slot in the Series 626 Mainframe, its presence and operation do not affect the operation of the Series 626. Communication with the Mainframe is limited to the interconnect cable from the Memory Module to the Communication Panel, and therefore the Memory Module cannot be accessed from the Series 626 front panel keyboard. The Memory Module operates completely independently from the Series 626 Mainframe.

1.7.1 Communication with the Series 626 Mainframe

Connection to the Series 626 Mainframe is made through an externally cabled serial link between the Series 626 Communication Panel's RS-232C port and the Data Input Connector Port on the rear panel of the Memory Module. Use the cable (Dranetz P/N 113677-G1) supplied with the Memory Module. The transmission rate is fixed at 9600 baud and occurs on an interrupt basis, allowing the Memory Module to collect data regardless of its current operating mode. **Note**: The Series 626 Mainframe must also be set for 9600 baud communication.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

Data from the Series 626 Mainframe is transmitted as required, provided a link between the Mainframe and the Memory Module is maintained. Transmission also suspends when FIFO RAM is full. When FIFO RAM is full, the Memory Module resets the CTS line to the Series 626 Mainframe, resulting in the halt of data flow. Transmission is not resumed until FIFO RAM on the Memory Module has had 64 bytes of data removed from it. (This is accomplished by requesting data from the Memory Module, by selecting CLR MEM from the main menu, or by resetting the Series 626 Mainframe). Once the required amount of bytes are free in FIFO RAM, the Memory Module re-asserts the CTS line to the Series 626 Mainframe and data flow resumes. The first response from the Mainframe is the 'RS-232 Restored' message, followed by the interrupted data stream. This serves as an indication to the user that FIFO RAM has been filled and possible data loss has occurred. Data loss can occur if both the Option Module buffer and the Series 626 Mainframe buffer overflow. Refer to the applicable Seres 626 Mainframe Operator's Manual for a description of the Mainframe event buffer.

Data also flows from the Memory Module to the Series 626 Mainframe through this link. Communication to the Mainframe is limited to user-initiated Series 626 remote commands and is not originated by the Memory Module. This transmission, while also at the 9600 baud rate, is not on an interrupt basis. It only occurs as requested by the user and consists only of single character data.

1.7.2 Communication with a Terminal

Data transmission between the Memory Module and a Terminal is performed on an interrupt basis through the RS-232C port or through the internal modem (with the 6038). Only one port can be used at a time, and with 6038, the RS-232C port has priority over the modem. Also with the 6038, if the RS-232C cable is connected to a valid device (even if communication is not established), the internal modem is disabled.

Transmissions to the Terminal can either be responses generated by the Memory Module or data passed from the Series 626 through the Memory Module FIFO RAM. Transmissions to the module are limited primarily to commands for the Memory Module or commands to be passed along to the Series 626.

1.7.2.1 Internal Modem (6038)

The 6038 plug-in comes equipped with an internal 'AT' compatible 300/1200 bps auto-answer modem. Connection to this modem is made using the RJ-11C jack located on the rear panel (see Subsection 2.2.5). A 25-foot phone cord (Dranetz P/N 11024-G1) is supplied. Configuration for this modem is done automatically and is ready for use provided the RS-232C connection is not present. When enabled, the modem is set for auto-answer and will receive incoming calls, adapting its rate to that of the calling modem. This can be either the 300 or 1200 bps rate. In addition, the Memory Module can initiate calls through the modem at a pre-selected rate, again either 300 or 1200 bps. Once the link between the calling and answering modems has been established, communication over the link proceeds normally. (See Subsections 2.4 through 2.6 for a description of this communication.)

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

1.7.2.2 RS-232C Port

Connection to this port is made using the rear panel 25-pin 'D' connector. (See Subsection 2.2.5). Use the cable (Dranetz P/N 103506) supplied with the Series 626 Mainframe when making this connection. With the 6038 plug-in, connection to this port disables the internal modem.

When the Memory Module recognizes that connection to the RS-232C port has been made, it initiates a check of the port to determine the presence of an external modem (see Subsection 2.2.6). If an external 'AT' compatible, 1200/300 bps modem is found, it is initialized and functions the same as the internal modem. If an external modem is not found, the port is initialized as a standard RS-232C connection with the baud rate set to the switch selected value (see Subsection 2.2.2).

1.7.3 Communication with a PC

Communication with a PC can only be performed with the aid of specialized software (See Appendix A). Dranetz Technologies provides software that allows communication with a variety of Dranetz products. Consult your Dranetz sales representative or the Dranetz Order-entry Department (201-287-3680) for more information.

1.7.4 Operating Modes

The Memory Module is a session oriented, menu driven system. While communication between the Memory Module and the Series 626 Mainframe can occur as long as the Mainframe is turned on and the physical connection between the two is in place, communication with a Terminal over the RS-232C or modem ports only occurs during valid sessions. A valid session can be initiated either from the Terminal (see Subsection 2.3.2.3) or from the Memory Module (See Subsection 2.5.2). Once the session is initiated, you can obtain any data stored in FIFO RAM, communicate directly with the Mainframe using its remote command set, or execute various system commands as presented by the Memory Module in the form of menu selections. For a complete description of the menu commands, refer to Subsections 2.5 through 2.5.6.

The functioning of the Memory Module is divided into three basic operating modes, all of which are user selectable. These modes are referred to as (1) Transparent, (2) On Request, and (3) Buffered. Each mode is designed to allow you to obtain data from the Series 626 in a manner suitable to your needs.

1.7.4.1 Transparent Mode

This mode can be selected only after a valid session has been established. If a session is terminated while in the Transparent mode, the Memory Module defaults to the On Request mode at the start of the next session.

The Transparent mode allows communication directly with the Series 626 Mainframe to program the Mainframe or any of its installed plug-in modules. All remote commands which can be executed through the Communication Panel of the Series 626 Mainframe are available in this operating mode. This allows complete remote access to the system over the communication link established through the Memory Module.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

In the Transparent mode, data events are transmitted to the Terminal as they occur. Since communication with the Series 626 Mainframe occurs in real-time, any data stored in FIFO RAM of the Memory Module must be retrieved before entering this mode to prevent a loss of continuity in the data stream from the Mainframe. This data is automatically transmitted if the Transparent mode is entered without first emptying the buffer.

To exit this mode and return to the Memory Module Main Menu, enter '@'.

1.7.4.2 On Request Mode

In this mode, data from the Series 626 Mainframe is simply placed in FIFO storage RAM until its transmission to the Terminal is requested. Requests for transmission can only be made after a session has been established and the Memory Module is in the On Request mode.

When the transmission is started, all data stored at the time of the request is sent. Any data received after the transmission has begun is stored in FIFO RAM but is not sent during this transmission. When the transmission is complete, the Memory Module terminates the current session and resumes collecting data until another request for transmission is received or the operating mode is changed. Transmission can be suspended by entering either a Ctrl+S or '@'. When received, the Ctrl+S simply halts transmission and it can only be resumed by issuing a Ctrl+Q. The receipt of the '@' command suspends transmission at the next "end of event boundary" (defined as two consecutive line feeds in the data stream) and returns you to the Main Menu. From here you can end the current transmission by terminating the session.

1.7.4.3 Buffered Mode

This operating mode allows selection of the percent of FIFO RAM to be filled before the Memory Module attempts a transmission. This percentage ranges from greater than 0% (which is effectively an immediate transmit mode) to greater than 90% (which allows the Memory Module to fill its storage buffer to 90% of capacity before attempting transmission of stored data).

After the buffer size is set and the current session is ended, the Memory Module continues to gather data from the Series 626 Mainframe. When the amount of data stored exceeds the selected percentage of RAM space, the Memory Module establishes a session and requests to transmit its data. If a negative response is received, the Main Menu is displayed to allow alternative actions. If an affirmative response is received, the Memory Module sends the stored data in the same fashion as the On Request mode. When the transmission is complete, the session is ended.

The Memory Module continues to collect data after the preset amount of data has been accumulated, as well as during and after transmission, but only the amount of data present at the start of a session is transmitted during that session.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

1.8 STANDARD ACCESSORIES

PART NUMBER	QUANTITY	DESCRIPTION
TM-113825 Vol. 1	1	Operator's Manual
113825-G1	1	External Modem interface cable (with 6037 plug-in only)
113825-G2	1	25-foot phone cord (with 6038 plug-in only)
113677-G1	1	Memory Module/626 interface cable
113676-G1	1	External Modem interface cable (w/6037 only)

1.9 OPTIONAL ACCESSORIES

PART NUMBER	DESCRIPTION
TM-113825 Volume 2	Service (maintenance) manual. See Subsection 1.10, item #3, for information on how to obtain this manual.

1.10 FACTORY REPAIR

When factory repair is required, proceed as follows:

1. Contact Dranetz Customer Service Department in order to obtain an authorization number for Factory repair.

   Telephone No: (201) 287-3680 Telex: 499-7808

   TWX: (710) 997-9553 Cable: DRANETZ

   FAX: (201) 248-9240

2. Fill out the REPAIR/SERVICE ORDER form enclosed in your Series 626 Operator's manual and ship it along with the malfunctioning equipment to Dranetz Customer Service Department.

3. In your Series 626 Operator's manual you have been supplied a Control Form with a registration number on it. The purpose of this form is to allow you to obtain the Volume 2 Service/Maintenance manual for the Series 626 Communication Option Board. Fill out and return this form if you want to obtain the Volume 2 manual. (If this form is missing, contact Dranetz Customer Service Department and request a replacement.)

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

SECTION II
INSTALLATION AND OPERATION

2.1 GENERAL

This section contains information on installing, programming, and operating the Memory Module.

2.2 INSTALLATION

The following subsections contain the installation instructions along with the applicable notes, cautions, and warnings.

2.2.1 Installation Warnings

WARNING

Be sure that the 626 Mainframe and all power connected to its plug-in modules are off before proceeding with any installation.

Because of possible shock or fire hazards, connection of this instrument should be performed in compliance with the National Electric Code (ANSI C1) and/or any other requirements which are applicable to the user. Installation, operation, and maintenance should be performed ONLY by qualified personnel. Qualifications for performing such procedures should be self-determined.

2.2.2 Baud Rate

The Memory Module's RS-232C port baud rate is factory set to 1200 baud. This can be changed by adjusting the rotary switch located on the printed circuit board of the unit. See Volume 2 of this manual for a table of Baud Rate Settings and instructions on making this adjustment.

NOTE

This baud rate only affects the baud rate of the RS-232C output port when connection is not to a modem. The internal modem (with the 6038 plug-in), an external modem, and the Data Input Connector Port are not affected by the switch setting.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

2.2.3 Load Ratings

The Series 626 Mainframe has an upper limit of the combined total load rating of its installed plug-in modules. The overall Mainframe capacity is set at 20 units. The individual modules (existing as of this printing) have load ratings as indicated in TABLE 2-1.

TABLE 2-1. LOAD RATING FOR PLUG-INS

Plug-In	Load Rating
626-PA-6001	2 Units
626-PA-6001 with extra option board	3 Units
626-PA-6002A	2 Units
626-PA-6002C	2 Units
626-PA-6003	4 Units
626-PA-6005	2 Units
626-PA-6006	2 Units
626-PA-6007	1 Units
626-PA-6008	2 Units
626-PA-6009	4 Units
626-PA-6011	1 Units
626-PA-6012	2 Units
626-PA-6012A	3 Units
626-PA-6013	2 Units
626-PA-6014	1 Units
626-PA-6015	4 Units
626-PA-6018	4 Units
626-PA-6020	4 Units
626-PA-6024A	4 Units
626-PA-6024B	4 Units
626-PA-6030	6 Units
626-PA-6037	1 Units
626-PA-6038	1 Units
626-PA-6040	6 Units

NOTE

When selecting modules for installation into any Series 626 Mainframe, verify that the sum of the load ratings of the installed modules DOES NOT exceed 20 units.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

2.2.4 Installation in the Mainframe

To install the Memory Module into the Series 626 Mainframe, proceed as follows:

1. Position the top and bottom front corners of the plug-in module into the upper and lower tracks of the desired slot position at the rear of the Series 626 Mainframe. (It is preferable to use slot #1--the fifth slot from the left when facing the rear panel.)

2. Carefully slide the module into the Mainframe until it is firmly in position.

3. Tighten the top and bottom captive screws to secure the module to the Mainframe.

2.2.5 Connection to the Communication Panel

Connection from the Series 626 Communication Panel to the Mainframe is accomplished using the 626/Memory Module cable (P/N 113677-G1) provided with the Memory Module. This is an 8-inch cable with a 25-pin 'D' connector at one end and a 9-pin 'D' connector at the other. Attach the 25-pin connector to the RS-232C port (labeled as J2) of the Communication Panel and attach the 9-pin end to the Data Input Connector Port (J1) on the Memory Module. Secure these connections by tightening the attached screws located at each of the cable's connectors.

2.2.6 Connection to the Memory Module RS-232C Port

Since this connector is electrically equivalent to the Series 626 Communication Panel's RS-232C connector, the cable provided with the Series 626 Mainframe (P/N 103506-G1) can be used for this connection. (Refer to the applicable Series 626 Mainframe Operator's manual for cable pin-out information.) The end labeled 626 on this cable connects to the RS-232C Connector Port (J2) on the Memory Module's rear panel. The other end connects to the desired RS-232C compatible device.

NOTE

If an external modem is the intended device to be used, refer to Subsection 2.2.6 for proper connection.

Due to the limitations of PCs and Terminals, the standard length of the RS-232C cable should not exceed 50 feet. For connection to customized hardware, an extended range (up to 2000 feet) RS-232C cable can be used. See Appendix B for information pertaining to this cable.

2.2.7 Connection to an External 'AT' Compatible Modem

In addition to the internal modem with the 6038 plug-in, both Memory Modules support external 300/1200 baud 'AT' command set compatible modems. The Memory Module can also communicate through some modems that are not "AT' compatible if the modem does not expect handshaking from the Memory Module. If a modem is not 'AT' compatible, the Memory Module treats it as any other RS-232C device.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

If an external 'AT' compatible modem is to be attached to the Memory Module's RS-232C port (J2), the external modem cable (P/N 113676-G1) must be used. (This is standard equipment with the 6037 plug-in.) Attach the end of the cable marked Memory Module to the RS-232C connector port (J2) of the Memory Module. Attach the other end to the RS-232C connector port of the external modem.

When connecting the external modem to the Memory Module, make sure that any of the setup parameters of the modem do not conflict with the operation of the Memory Module. Because of variations in the numerous makes and models of 'AT' compatible modems, no specific setup information for all modems can be given. In general, when setting the parameters of the external modem, be sure to conform to the following guidelines:

- The modem should respond to DTR control line
- The modem should transmit result codes
- The modem should allow the DCD to follow the carrier status
- The modem should be Bell 212A compatible
- The modem should recognize the complete 'AT' command set

Consult the instruction manual of the modem to be used for complete details.

2.2.8 Connection to the Internal Modem (6038)

The modem in the 6038 plug-in has been approved by the FCC (Federal Communications Commission) for direct connection to the Public Switched Telephone Network. To comply with FCC regulations, you must be aware of certain procedures and considerations regarding the installation and operation of registered Terminal equipment.

The following subsections (2.7.1 to 2.7.6) are paraphrased from a list of FCC Specifications, Part 68.

2.2.8.1 Notification of the Telephone Company

Before connecting to the telephone network, notify the telephone company of the line that you are using, the FCC Registration Number, the Ringer Equivalence of the modem, and the type of jack required for the connection. (This information appears on the rear panel of the Series 626 Mainframe, but is also stated below for your convenience.) You must also notify your telephone company upon final disconnection of the equipment.

FCC Registration Number: AK396F-72383-MD-E
Ringer Equivalence: 0.5B
Phone Jack (USOC): RJ-11C

2.2.8.2 Connection to the Telephone Network

All direct connection to the telephone network must be made through standard plugs and jacks as described in Part 68, Subpart F, of the FCC Rules. Connection to party lines and coin telephone service phones is prohibited.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

2.2.8.3 Responsibilities of the Telephone Company

The telephone company shall supply, upon request, the technical information required to permit compatibility with its facilities. To allow you the opportunity of maintaining uninterrupted service, the telephone company shall give you adequate notice of changes in its facilities and operations that may affect the use or performance of your equipment.

2.2.8.4 In Case of Trouble

If you experience operating difficulty, disconnect the modem from the telephone line to determine if the equipment is malfunctioning. DO NOT use the modem until the problem is solved.

2.2.8.5 Incidence of Harm

If your modem causes harm to the telephone network, the telephone company shall, if feasible, notify you that service may be temporarily discontinued. If it becomes necessary to discontinue service immediately without prior notice, the telephone company shall promptly notify you and give you the opportunity to register a complaint to the Commission (FCC), pursuant to the procedures set forth in Part 68, Subpart E of FCC Rules.

2.2.8.6 Service

All service and repairs must be performed by either Dranetz Technologies, Inc. or Dranetz Service Corporation. If unauthorized modification or repair is performed, both the FCC Registration and the manufacturer's warranty in effect become null and void. If a malfunction is suspected, it is your responsibility to contact Dranetz Service Corporation for further instructions.

2.3 OPERATION AND PROGRAMMING

2.3.1 Power-on/reset

Each time the key on the front panel of the Series 626 Mainframe is turned to "ON" or "RESET", the Memory Module enters its initialization routine. This entails a memory diagnostic to validate the storage RAM, initialization of storage RAM, setup of all I/O ports, initialization of the internal modem (if present), and setting of all default operating parameters.

NOTE

Resetting the 626 Mainframe clears all stored data in the Memory Module. Be sure to retrieve all data before resetting or turning off the Mainframe.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

The default parameters are as follows:

- Operating mode: On Request
- Modem dial type: tone dialing
- Modem originate speed: 1200 bps
- Telephone number: 222

After initialization, the Memory Module checks for the presence of the Series 626 link. If found, the port is activated and data is allowed to flow from the Mainframe to the Memory Module storage RAM.

2.3.2 Log-on Procedure

The following log-on procedure must be followed to establish a valid session and to gain access to the Memory Module menu features.

2.3.2.1 Using the RS-232C Port

When the module detects the presence of the RS-232C cable, it tests for a valid modem connection (detection of any valid RS-232C device disables the internal modem in the 6038 plug-in). This consists of the transmission of an 'ATZ' character string at a 1200 baud rate. This is a reset command for an 'AT' type modem. If an 'AT' compatible external modem is found, it is initialized the same as an internal modem. (Refer to Subsection 2.3.2.2 below for the internal modem operation). If a modem is not found, the unit waits for the log-on sequence outlined in Subsection 2.3.2.3.

2.3.2.2 Using the Internal Modem of the 6038 Plug-in

With the 6038 plug-in, if the internal modem is present and there is not a valid connection to the RS-232C port of the Memory Module, communication with the unit can be made through the internal modem. Make sure proper connection to the phone line is made (See Subsection 2.2.7) before trying to access the Memory Module through this modem.

The modem is initialized to automatically answer incoming calls and to adjust its speed to that of the calling modem: either 300 or 1200 bps. Once the link is established, the modem notifies the Memory Module of the connection and the Memory Module adjusts the baud rate to that of the modem. At this point, communication can proceed using the log-on sequence outlined in Subsection 2.3.2.3.

NOTE

If a connection to the RS-232C port is made, the internal modem is disabled and will not answer incoming calls until the RS-232C port connection is removed.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

2.3.2.3 Log-on Sequence

The log-on sequence consists of the '@' symbol and one of the characters which set the error checking mode to be used in this session (see Subsection 1.6.1.2). When communication is with a Terminal, simply press the RETURN or ENTER key. (The other error checking modes are used with customized software.)

After receiving this sequence, the Memory Module responds with a prompt: '>'. At this prompt, enter the unit's ID number (default is 00). If an error is encountered at any point in this sequence, the log-on is terminated and must be restarted from the beginning (from the '@' symbol). If the correct ID is found, the Memory Module enters the Main Menu. This ID sequence is only valid for the non-error checking mode.

NOTE

Menus and text responses are suppressed for the ^V (error checking with text suppression enabled) mode. Therefore, the following description of menu and status messages does not apply when this error checking is employed. The system, however, still responds to the menu commands as if the text were transmitted.

The Memory Module is still able to receive data from the Series 626 port while the session is in progress.

2.4 STATUS MESSAGE

Each time the unit enters the Main Menu, it outputs the system status prior to the menu. Below is an example of this message:

```
**************************
COMM. OPTION BOARD
    SYSTEM STATUS
**************************
**************************
STATION ID=00
TRANSMIT MODE:
    ON REQUEST
626 LINK ON
FIFO SIZE = 128K
    1% FULL
**************************
```

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

The first line of this message is the current ID number. This is followed by the current transmission mode. The possible modes are On Request, Buffered, and Transparent. Next is the status of Series 626 port. If the port connection is valid, the link is on as illustrated. If no valid connection exists, the message indicates the link is off. The current size of valid storage RAM is shown on the next line. The system is equipped with 128K of static RAM. At power on, a complete diagnostic test is made of this RAM as well as ongoing diagnostics during normal operation. If a malfunction is found in RAM, the page on which the problem occurred is disabled (page size is 16K). Due to this, the actual amount of valid RAM can range from a full 128K down to zero. If the latter occurs, the status message indicates FIFO failure. The last line of the message indicates the amount of data in storage RAM. This is given as a percentage of the currently available RAM as shown on the previous line of the status message.

2.5 MAIN MENU

Immediately after the status message is displayed, the Main Menu appears. Below is an example of the Main Menu display:

```
************************
  SELECT FUNCTION
************************
FNC1=CLR MEM
FNC2=XMIT MODE
FNC3=ID#
FNC4=XMIT
FNC5=MODEM MENU
FNC6=END SESSION
************************
```

To select a function, simply enter the number corresponding to the desired function: 1, 2, 3, 4, 5, or 6. The following subsections contain brief descriptions of each function.

2.5.1 FNC1 = CLR MEM

The Clear Memory function (FNC1) is selected by pressing '1', causing the Memory Module to output the following message:

```
CLEAR DATA MEMORY?
ENTER Y/N
```

To reset the storage FIFO to zero data, press 'Y'. Pressing an 'N' aborts the clear memory command. After responding to the 'Y' or 'N', the Memory Module outputs the updated status followed by the Main Menu.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

2.5.2 FNC2 = XMIT MODE

Function 2, which allows the changing of the transmission mode, is selected by pressing '2'. The Memory Module responds by outputting the following Submenu:

SELECT XMIT MODE:

1. TRANSPARENT
2. ON REQUEST
3. BUFFERED

ENTER CHOICE

1. Transparent Mode. After pressing '1', the Memory Module attempts to set the Mainframe to the Remote mode. This is done by transmitting the Remote/Local command (~) to the Mainframe. If the unit was in the Local mode, it immediately toggles to the Remote mode and enters the Transparent mode. If the Mainframe was in the Remote mode, it first toggles to the Local mode and then toggles back to the Remote mode before the Memory Module enters the Transparent mode. The time required for this process varies, depending on the status of the Mainframe (may be up to eight seconds). This causes any data currently in the buffer to be transmitted until the buffer is emptied. Once the buffer is cleared, you can communicate directly to the Series 626 as though connected directly to the Series 626 Communication Panel; all commands valid for the Mainframe can be executed. (Refer to the Series 626 Mainframe manual for a complete description of remote communication and commands). Events are output to the Terminal as they occur. To exit this mode, an '@' character sends the system back into the Main Menu where a new mode can be selected. If the session is ended during the Transparent mode, the mode defaults to the On Request mode.

2. On Request Mode. Pressing '2' selects the On Request mode and returns control to the Main Menu. In this mode, data input from the Series 626 is stored in FIFO RAM until a request for a data transmission is entered by selecting FNC4 from the Main Menu (See Subsection 2.5.4) or until an alternate mode is chosen.

3. Buffered Mode. The Buffered mode is selected by pressing '3'. The buffered amount must then be selected from the following Sub-menu:

SELECT BUFFER SIZE

0. >0%
1. >10%
2. >20%
3. >30%
4. >40%
5. >50%
6. >60%
7. >70%
8. >80%
9. >90%

ENTER CHOICE:

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

After selection of the desired buffer size, the Memory Module returns to the Main Menu. Data received from the Series 626 is stored in FIFO RAM. When the percentage of stored data exceeds the selected size value, the Memory Module attempts a data transmission (see Subsection 2.6.2). Data gathering does not stop when FIFO RAM reaches this preset amount, but only the preset amount is transmitted.

2.5.3 FNC3 = ID#

Function 3 allows the setting of the unit's ID number. Pressing '3' selects this function and causes the following prompt to appear:

ENTER ID NUMBER:
(ENTER 'X' TO ABORT)

This two-digit ID number can range from 00 (default) to 99. If an invalid key is pressed, the Memory Module indicates that an invalid entry was made and repeats the prompt to enter an ID number. If an 'X' is entered, control is returned to the Main Menu without altering the ID number. Upon entry of the valid two-digit number, the ID number is changed and control is returned to the Main Menu.

2.5.4 FNC4 = XMIT

This function is selected by pressing '4', causing the Memory Module to check the current transmit mode. If it is not the On Request mode, the Main Menu is repeated. If the mode is On Request, the following prompt is output:

START TRANSMIT ?
ENTER Y/N

Pressing an 'N' aborts the process and returns control to the Main Menu. Pressing a 'Y' initiates a transmission of the current data in FIFO RAM. The transmission continues until either all the data is sent or an '@' is received. Once all the data is sent, the current log-on session is terminated and FIFO RAM continues to store data from the Series 626. If the '@' is received before the data is exhausted, transmission is suspended at the nearest end of the event boundary (defined as back to back CR/LF sequences), and control is returned to the Main Menu. Transmission can be resumed by re-selecting this function.

2.5.5 FNC5 = MODEM MENU

This function, selected by pressing '5', passes control to the Modem Menu. This menu is used for setting the originate parameters for the internal (with 6038 plug-in) or external modems. These parameters are used by the Memory Module to initiate an outgoing telephone call. The modem status message, shown below, precedes the Modem Menu:

```
************************
    MODEM STATUS
************************
PHONE NUMBER:
222
DIAL SPEED:
   1200 BPS
DIAL MODE:
   TONE
```

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

The first entry on the status message is the currently stored telephone number. This is the number used by the Memory Module when initiating a call. Next on the message is the originate speed. This is the speed the Memory module uses when it initiates a call. Finally, the last entry is the dial type used by the Memory Module to initiate a telephone call.

After the status message, the Modem Menu appears. Below is an example of the Modem Menu:

```
************************
      MODEM MENU
************************
0.  MAIN MENU
1.  PHONE NUMBER
2.  CALLOUT SPEED
3.  PULSE/TONE DIAL
************************
```

0. MAIN MENU. Pressing '0' from the Modem Menu returns control to the MAIN MENU.

1. PHONE NUMBER. This function allows entry of a new telephone number to be used by the unit to call out. Pressing '1' from the Modem Menu causes the Memory Module to output the following prompt:

CHANGE PHONE NUMBER ?
ENTER Y/N

A negative response here sends control back to the Modem Menu without affecting the currently stored number. A positive response results in the following prompt:

ENTER NEW NUMBER

The desired telephone number can now be entered. This number can be up to 16 digits including the typical telephone digits: 0-9 and #, A, B, C, D. In addition, it can include the following dialing commands:

, - This causes a 4 second delay during dialing.
! - This is the flash command.
/ - This causes the modem to delay for ⅛ second.
@ - This causes the modem to wait for 5 seconds of silence.
W - This causes the modem to wait for a dial tone before continuing to dial.
R - This allows the calling of an originate only modem by placing the Memory Module in the answer mode after a connection is made.

If an invalid entry is made, or if more that 16 digits are entered, this function is terminated without updating the phone number. Control is returned to the Modem Menu.

The entry of a valid number is completed with a carriage return. The number is updated and control is returned to the Modem Menu.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

2. CALLOUT SPEED. This command allows the selection of the originate speed. Pressing '2' from the Modem Menu causes the Memory Module to output the following submenu:

0. 300 BPS
1. 1200 BPS
ENTER CHOICE

Pressing the number corresponding to the desired rate updates the speed and returns control to the Modem Menu. If an invalid key is pressed, control is returned to the Modem Menu without updating the speed. The selected originate speed should reflect the capabilities of the receiving modem. Since the 1200 bps speed is considerably faster than 300, 1200 is the preferable rate.

NOTE

This rate only applies to the originate function. When receiving incoming calls, the Memory Module adapts to the calling modem's speed: 300 or 1200 bps.

3. DIAL TYPE. This command allows the selection of dialing for outgoing calls. Pressing '2' from the Modem Menu causes the Memory Module to output the following submenu:

0. PULSE DIAL
1. TONE DIAL
ENTER CHOICE

This should reflect the capabilities of the phone system to which the Memory Module is connected. The default setting is for tone dialing (method employed in push button style phones). This method is faster than pulse dialing (method employed in rotary style phones), although it is not necessarily supported in all areas. Check with your local telephone company if you have any doubts about the capabilities of the system.

After the selection is made, the dial type is updated and control returns to the Modem Menu. If an invalid key is pressed, control is returned to the Modem Menu without altering the dial type.

2.5.6 FNC6 = END SESSION

Selecting this function from the Main Menu causes the Memory Module to output the following prompt:

END SESSION ?
ENTER Y/N

Pressing 'N' returns control to the Main Menu. Pressing 'Y' results in the following message followed by a log-off:

****
END OF SESSION
****

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

The Memory Module continues to gather data from the Series 626 Mainframe and store it in FIFO RAM. If the session is ended during the Buffered mode, when enough data is collected to reach the preset value (see FNC2 above), the Memory Module establishes a new session and attempts to transmit data. If the session is ended during the Transparent mode, the system always reverts to the On Request mode.

To initiate another session, the log-on procedure must again be performed.

2.6 SAMPLE SESSIONS

Below are two examples of operating the Memory Module in a Series 626 environment. The first is an example illustrating both the programming of the 626 Mainframe through the Memory Module and the retrieval of stored data from FIFO RAM. This is shown using an RS-232C port connection. The second example illustrates the Memory Module's capability to initiate data transfers in the Buffered mode through its internal modem. Both examples assume error checking is disabled.

2.6.1 On Request Mode Example

Resetting or turning the 626 Mainframe on while a 1200 baud Terminal device is connected to the RS-232C port of the Memory Module causes the following message to appear on the Terminal device:

ATZ

This is the Memory Module query testing for an external modem. When no modem is found, the Memory Module waits for the start of the log-on sequence.

NOTE

User entries are shown in bold type and preceded with a dash in the examples below; (CR) designates a carriage return; comments are in parentheses.

The session begins with the log-on sequence:

```
- @(CR)                          (log-on without error checking.)
  >                              (System prompt for ID#.)
-                                (User enters ID which is not echoed.)
  ************************
  COMM. OPTION BOARD  (Status Message appears)
     SYSTEM STATUS
  ************************
  ************************
  STATION ID=00
  TRANSMIT MODE:
        ON REQUEST
  626 LINK ON
  FIFO SIZE=128K
        0% FULL
  ************************
```

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

```
**************************
SELECT FUNCTION          (Main Menu follows Status Message)
**************************
FNC1=CLR MEM
FNC2= XMIT MODE
FNC3=ID
FNC4=XMIT
FNC5=MODEM MENU
FNC6=END SESSION
**************************

- 2                      (FNC2 selected to change modes.)

SELECT XMIT MODE:

1. TRANSPARENT
2. ON REQUEST
3. BUFFERED

ENTER CHOICE:

- 1                      (Transparent mode selected.)

REMOTE ONLY MODE         (Memory Module sets the 626
99/99/99  12:12:12        to the Remote Only mode)
- G                      (626 program mode selected;
                          Communication is directly with the 626)
        Program Mode

99/99/99        12:12:12

ENTER DATE
(MM:DD:YY)

- 03:10:88
TYPE 'E' (ENTER)
- E
03/12/88        12:12:12

ENTER TIME
(HH:MM)

- 10:44
TYPE 'E' (ENTER)
- E
03/10/88        10:44:00

ENTER DATE               (This message can be disregarded)
(MM:DD:YY)

- O
OPERATE MODE

ALARM ON                 (Status Message; Programming is finished)
```

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

```
- @                          (Returns control to the Memory Module)
  ************************
  COMM. OPTION BOARD        (Status Message and Main Menu displayed)
       SYSTEM STATUS
  ************************
  ************************
  STATION ID=00
  TRANSMIT MODE:
      TRANSPARENT
  626 LINK ON
  FIFO SIZE=128K
            0% FULL
  ************************
  ************************
  SELECT FUNCTION
  ************************
  FNC1=CLR MEM
  FNC2=XMIT MODE
  FNC3=ID#
  FNC4=XMIT
  FNC5=MODEM MENU
  FNC6=END SESSION
  ************************

- 6                          (FNC6 selected to end session)
  END SESSION ?              (Prompt for confirmation)
  ENTER Y/N

- Y

  ************************
       END OF SESSION
  ************************
```

The Memory Module continues to collect data from the 626 Mainframe and place it in its storage RAM. Although the operating mode of the Memory module was left in the Transparent mode in the above example, it automatically changes to the On Request mode. When a session is re-established to request the recently accumulated data, the Memory Module is in the On Request mode, as in the example below.

```
- @(CR)                     (Log-on with no error checking.)
  >                         (System prompt for ID#.)
-                           (ID entered but not echoed.)
  ************************
  COMM. OPTION BOARD
       SYSTEM STATUS
  ************************
  ************************
  STATION ID=00
  TRANSMIT MODE:
      ON REQUEST
  626 LINK ON
  FIFO SIZE=128K
```

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

```
          1% FULL
**************************
**************************
SELECT FUNCTION
**************************
FNC1=CLR MEM
FNC2=XMIT MODE
FNC3=ID#
FNC4=XMIT
FNC5=MODEM MENU
FNC6=END SESSION
**************************
```

- **4** (FNC4 selected to dump data buffer.)
  START TRANSMIT ? (Prompt for confirmation)
  ENTER Y/N

- **Y**

Any data stored in RAM is transmitted to the Terminal in the same format as from the 626 Communication Panel. When the transmission is completed, the Memory Module logs off. In this case, the buffer is 1% full and this data is transmitted before the Memory Module ends the session. If the buffer was empty, the session would have ended without any transmission.)

```
**************************
     END OF SESSION
**************************
```

This completes a sample On Request data session with initial programming of the 626 Mainframe.

2.6.2 Buffered Mode Example

In this example, communication with the 6038 plug-in is through its internal modem. The RS-232C port is not connected and a connection to the telephone system is established. To initiate the session, the Memory Module is called from a Terminal device connected to a 1200 bps modem. After the first ring, the Memory Module's internal modem answers and establishes a valid link with the calling modem at 1200 bps. When the Terminal receives a connect message from the calling modem, the Memory Module is ready for log-on.

- **@(CR)** (Log-on without error checking.)
  > (System prompt for ID#.)
- (User enters ID which is not echoed.

```
**************************
COMM. OPTION BOARD  (Status Message)
    SYSTEM STATUS
**************************
**************************
STATION ID=00
TRANSMIT MODE:
    ON REQUEST
```

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

```
626 LINK ON
FIFO SIZE=128K
        0% FULL
************************
************************
SELECT FUNCTION        (Main Menu)
************************
FNC1=CLR MEM
FNC2=XMIT MODE
FNC3=ID#
FNC4=XMIT
FNC5=MODEM MENU
FNC6=END SESSION
************************

- 2                            (FNC2 selected to change modes.)

SELECT XMIT MODE:

1.  TRANSPARENT
2.  ON REQUEST
3.  BUFFERED

ENTER CHOICE:
- 3                            (Buffered mode selected.)

SELECT BUFFER SIZE

0.  >0%
1.  >10%
2.  >20%
3.  >30%
4.  >40%
5.  >50%
6.  >60%
7.  >70%
8.  >80%
9.  >90%

ENTER CHOICE:
- 0                            (0% selected)

************************
COMM. OPTION BOARD  (Status Message and Main Menu displayed)
    SYSTEM STATUS
************************
************************
STATION ID=00
TRANSMIT MODE:
    BUFFER TO 0%
626 LINK ON
FIFO SIZE=128K
        0% FULL
************************
```

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

```
**************************
SELECT FUNCTION
FNC1=CLR MEM
FNC2=XMIT MODE
FNC3=ID#
FNC4=XMIT
FNC5=MODEM MENU
FNC6=END SESSION
**************************

- 6                          (FNC6 selected to end session.)
  END SESSION ?              (Prompt for confirmation.)
  ENTER Y/N

- Y
  **************************
       END OF SESSION
  **************************
```

The Memory Module monitors the input from the 626 Mainframe. Since >0% is the selected value, the Memory Module establishes contact as soon as it receives an event and a request to transmit data.

```
  **************************
  COMM. OPTION BOARD
  STATION ID=00
  **************************
  START TRANSMIT ?           (Prompt for confirmation.)
  ENTER Y/N
- Y                          (Confirmation to begin transmit.)

    113.0 V                  (Event data output.)
1   INC 12:16:32.5

  **************************
       END OF SESSION        (Option Module terminates session.)
  **************************
```

The Memory Module transmits the event it has received, ends the session, and continues to scan for data as before.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

SECTION III

OPERATIONAL TEST

3.1 GENERAL

Since the Memory Module is not controlled by the 626, it does not respond to the System Check of the 626 Mainframe. All diagnostics for the Memory Module are performed independently of the 626 and are internal to the Memory Module.

Upon initial power on or reset of the Memory Module, a full system check is performed to verify the proper operation of the buffer and internal modem (with the 6038 plug-in).

Problems encountered during this check are given in the Status Message output and faulty RAM is disabled. If all RAM is found to be faulty, the message FIFO ERROR appears on the status message notifying the user that data cannot be collected since RAM is not available for storage.

After this initial testing, the Memory Module continually runs diagnostics during its normal operation to ensure the system is functioning properly. Again, if RAM errors are found, that section of RAM is disabled and its deletion can be found in the Status Message where the current RAM size is given.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

APPENDIX A

USING THE 6037/6038 WITH A PC AND DRANETZ SOFTWARE

A.1 GENERAL

The Memory Module can be accessed by a PC equipped with proper software. This software can be customized, or can be supplied by Dranetz Technologies, Inc.

A.2 DATA ACQUISITION SOFTWARE (DAS)

(Refer to TM-113499)

Data Acquisition Software (DAS) allows communication with the 626 Mainframe from a PC. Without the Memory Module, the connection would be through a Series 710 Data Communications Multiplexer (DCM) and RS-232C cables. The Memory Module allows this connection to be made over phone lines and independently of the Series 710 Data Communications Multiplexer.

DAS is completely menu driven and allows you to use the same system to monitor all of the Series 626s.

A.2.1 Communication

DAS is completely menu driven. Communication with the Memory Module is automatic and handled through the software. Programming the 626 is done in the Memory Module's Transparent mode. The effect is that of communicating directly with the 626, because there is never any contact with any of the Memory Module's menus.

NOTE

It is important to leave the Memory Module in the On Request mode if you intend to communicate with it using DAS. The Buffered mode cannot operate properly *since DAS is designed to make calls, not receive them.*

A.2.2 Data Retrieval

DAS can monitor up to 64 Series 626 Mainframes. DAS actually calls each device at user-selected intervals (from 1 to 999 hours) and checks for new event data. If there is new data, the data is retrieved and added to the file with all accumulated data for that device. DAS then indicates there is new data in the file.

Data from each device can also be retrieved upon request by accessing the device from Level One of the DAS Main Menu. Using available utilities. it is possible to graph the event data for analytical purposes. These graphs can be printed and included in reports.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

APPENDIX B

ISOLATED SERIAL INTERFACE CABLE INFORMATION

B.1 GENERAL

Connector J2 located on the rear panel of the Memory Module provides both an RS-232C port and an optically isolated/balanced serial interface. The serial interface allows connection of up to 2000 feet and can be used with customized hardware.

B.2 PINOUT INFORMATION

CAUTION

Be careful not to connect signals to any pins of Connector J2 unless they are actually being used. Making incorrect connections to any pins for the J2 connector port may damage the Memory Module or the device connected to it.

Connections for the isolated serial interface and the standard RS-232C interface should not be made through the same cable.

TABLE B-1 provides a description of each pin of J2 used in the Isolated Serial Interface.

The recommended cable type is five twisted pairs, 24 AWG stranded, and individually shielded.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

TABLE B-1. PINOUT OF OPTICALLY ISOLATED/BALANCED SERIAL INTERFACE

PIN	NAME	FUNCTION	DIRECTION	DESCRIPTION OF OPERATION
1	PGND	Protective Ground	N/A	Connects to interface cable shield. Pin is internally grounded to the Memory Module.
7	SGND	Signal Ground	N/A	Internally connected to pin 1 in the Memory Module.
14 16	XMT+ XMT−	Transmit Data (balanced)	To OM	Balanced isolated input. Serial data output from the connected device is sent to the Memory Module. DTR+/DTR− must be TRUE for the data to be recognized.
18 19	RCV+ RCV−	Receive Data (balanced)	From OM	Balanced output. Serial data output from the connected device is sent to the Memory Module, provided DTR+/DTR− is TRUE.
21 22	DTR+ DTR−	Data Terminal Ready (balanced)	To OM	Balanced isolated input. This signal must be TRUE for the Memory Module to acknowledge the presence of a connected device. A FALSE state causes an immediate disabling of the port.
15	XCLK	DCE Xmit Clock	From OM	Xmit clock of data outputted by the Memory Module. Frequency = 16 x baud rate.
17	RCLK	DCE Rcv Clock	From OM	Receive clock of data transmitted into the Memory Module. Internally jumpered in the Memory Module to XCLK and DTE Xmit Clock, therefore, Xmit and Receive baud rates must be equal.
11 23	DCD+ DCD−	Carrier Detect (balanced)	From OM (TRUE)	Balanced output. Provided by the Memory Module as a TRUE signal, enabling both sending and receiving.
9 10	+12 V DC −12 V DC		From OM From OM	+12 V DC with 1/16 A fuse. −12 V DC with 1/16 A fuse. (Both are for future use.)

N/A = Not Applicable
OM = Memory Module

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

APPENDIX C

CONNECTION OF THE MEMORY MODULE TO AN EXTERNAL MODEM

C.1 GENERAL

The 6037 and 6038 plug-ins (although the 6038 already has a built-in modem) are designed to operate with a stand-alone 'AT' command set compatible 300/1200 bps modem. A typical example of this type of modem is the Hayes Smartmodem 1200. The Memory Module also communicates through many non-'AT' compatible modems, as long as the modem does not expect handshaking from the Memory Module other than DSR/DTR. If the modem is not 'AT' compatible, the Memory Module treats it as any other RS-232C device.

Below is the description of the interface, both hardware and software, between the Memory Module and the external modem.

C.2. HARDWARE---RS-232C PIN ASSIGNMENTS

The Memory Module expects the following lines from the external modem:

Receive Data
Clear to Send (CTS) [or Data Set Ready (DSR) if DSR is independent of Data Carrier Detect (DCD); CTS can be always low]
High Speed Indicator (HS) [low for 1200 baud, high for 300 baud].

The Memory Module provides the following lines to the external modem:

Transmit Data
Data Terminal Ready (DTR) [always set low]

C.2.1 RS-232C Pin Assignments

Dranetz cable P/N 113676-G1 must be used when communicating with the external modem. This male-to-male 25-pin "D" cable converts the Memory Module from DCE to DTE.

The modem must use the following RS-232C lines:

1	----------	Protective Ground
2	----------	Transmit data
3	----------	Receive data
5	----------	Clear To Send
7	----------	Signal Ground
8	----------	Data Carrier Detect
12	----------	High Speed Indicator
20	----------	Data Terminal Ready

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

FIGURE C-1 below illustrates how the Memory Module/External Modem cable (Dranetz P/N 113676-G1) is configured.

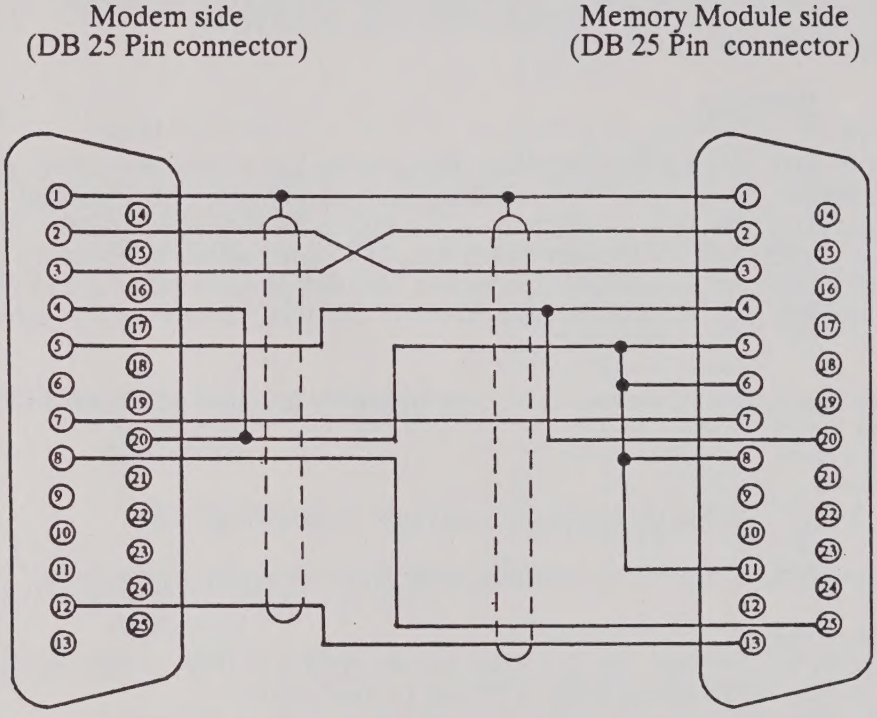

FIGURE C-1. MEMORY MODULE/EXTERNAL MODEM CABLE CONFIGURATION.

C.2.2 Modem Default Switches

When connecting an 'AT' compatible modem to the Memory Module, be sure that any special modem setup features present on the particular modem do not conflict with the operation of the system. Since there are a variety of models and manufacturers of these modems, no specific setup information applying to all modems can be given. In the example on the following page, the default switch settings particular to the Hayes Smartmodem 1200 are illustrated. Consult the instruction manual of the modem to be used for complete specifications on setup parameters.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

The Hayes Smartmodem 1200 has a set of 10 configuration switches located behind the front panel. For use in this system, these switches should be configured as follows:

Switch	Description	Hayes Smartmodem Switch Setting
1	Supports the RS-232C DTR line	UP
2	Word result codes	UP
3	Displays result codes	DOWN
4	Echo enabled	UP
5	Auto Answer enabled	UP
6	DCD follows the carrier status	UP
7	Set for simple RJ-11C Jack	UP
8	Allows command recognition	DOWN
9	Set for Bell 212A compatible	UP
10	Modem resets after DTR lost	UP

C.3 SOFTWARE---COMMUNICATION PROTOCOL

The following is a brief description of the software handshaking that takes place between the Memory Module and the external modem device.

Upon detection of an active DSR line (pin 4) at the Memory Module's RS-232C input port, the Memory Module queries the connected device for the presence of an 'AT' compatible modem. This is done by transmitting, at 1200 baud, an "ATZ", which is the software reset command for these modems. If the device responds with a "K" or a "0", the Memory Module assumes an external modem has been found and proceeds with its setup sequence. If any character other than a "K" or a "0" is received by the unit, or if no response is found after a 1½ second delay, a non-modem device is assumed to have been connected. Communication then proceeds under this assumption.

If the proper response is found, the setup sequence begins. This is done by sending the following command sequences to the modem:

"ATV0E0" - Set for digit result codes and no echo.

"ATB1C1F1M1Q0X0Y0" - Set for Bell 212A mode, carrier active, full duplex, speaker on, result codes displayed, Smartmodem 300 compatible, and long space disabled.

"ATS0=0S2=43S3=13S4=10S5=8S6=4" - This sets the modem to disable auto answer, escape character "+", carriage return is 13, line feed is 10, backspace is 8, and wait 4 seconds for a dial tone.

"ATS7=30S8=4S9=8S10=9S11=70S12=50" - This sets the modem to wait 30 seconds for carrier, pause character waits 4 seconds, 8mS carrier detect response time, 9mS loss of carrier delay, 70 mS tone dialing timing, and 1-second escape code guard band time.

If the above setup fails for any reason after two consecutive attempts, the modem is aborted and a non-modem connection is assumed. If the setup is good, the modem is then set for auto-answer.

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.

The Memory Module can now either initiate or answer calls. To initiate a call, the unit attempts a dial out at the pre-selected baud rate using the pre-selected dial mode (pulse or tone). If the connection is successful, communication proceeds normally. If after 40 seconds a connection is not made, the attempt is aborted and the unit delays for 40 seconds to allow for incoming calls. After the delay, the call out is again attempted unless program parameters were changed in the interim. To answer calls, the unit simply monitors the DCD line. When this line is activated, the unit tests the HS line and adjusts its baud rate accordingly. Communication then proceeds normally.

At the completion of the session, the unit transmits the escape code character string, "+++", waits for 1 second, and hangs up. If the hang-up fails, the DTR line is dropped momentarily, causing an automatic hang-up by the modem. If at any time during communication the DCD is lost for more than 900 mS, or if the CTS goes high, the hang-up procedure is followed and the connection is terminated.

www.manualsplus.com
1001598

COPYRIGHT © 1988 DRANETZ TECHNOLOGIES, INC. ALL RIGHTS RESERVED.